

GSOS

GPS SURFACE OBSERVING SYSTEM INSTALLATION PROCEDURES



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GSOS Installation Procedure

The installation of the GSOS requires the following tools:

- #2 Flat Blade Screwdriver
- 1/16" - 1/4" Allen Head Wrenches
- 2- 3/4" Adjustable Wrenches
- 3/4" Socket Wrench (optional but very useful)

The GSOS payload installation kit consists of the following items (shown in Figure 1 below from left to right):

- Fold-down arm assembly, barometric pressure port extension, and sensor radiation shield
- Mounting plate for GSOS Payload
- Fence/Rohn Tower Mounting Assembly
- GSOS Payload Enclosure
- GSOS Power Supply & Communications Interface Assembly (not shown)
- Power and Communications Interface Cable (not shown)
- T/RH Sensor Pull-Cable (not shown)
- Desiccant Cylinder (not shown)



Figure 1 Major GSOS payload components

PAYLOAD INSTALLATION

1. Attach the GSOS Mounting Assembly to an existing 2.5" fence post, Rohn tower leg, or 4" wooden fence post (see Figure 2). Adapter plates can be omitted from the assembly to best fit the existing type and size of post (metallic or wood). Make sure that the assembly is installed with the rounded flange to the bottom and the slot for the cotter pin at the top. The flange is the pivot point for the fold-down arm, and the slot for the cotter pin that secures the arm in the "up" position.
2. Attach the fold-down arm to the bottom of the mounting assembly with a bolt so that the arm pivots in a counter clockwise direction. After it is attached, rotate the arm to the vertical position and secure it with the cotter pin.
3. Attach the GSOS Payload mounting plate to the mounting assembly using four bolts (see Figure 3). Use a flat washer and split ring washer on all four mounting bolts, or the arm will not fold down correctly.
4. Attach the GSOS Payload to the mounting plate using four bolts as illustrated in Figure 4. The Payload interface connectors should be oriented towards the ground.

***** Warning *****

Do not over-tighten the mounting bolts, or the plastic tabs supporting the GSOS enclosure may crack.



Figure 2 Mounting GSOS Equipment to Pole



Figure 3 Attaching the GSOS Payload Mounting Plate

5. Remove the four screws from the front of the GSOS Payload and swing the access door open as illustrated in Figure 5.
6. The Temperature/Relative Humidity (T/RH) Sensor and cable is coiled in the bottom of the GSOS Payload. Uncoil the sensor and straighten the cable being sure to remove any kinks.
7. Unscrew the compression nut from the stuffing tube on the bottom of the GSOS Payload. The stuffing tube assembly consists of two plastic washers, a rubber grommet, and the compression nut (see Figure 6). The washers and rubber grommet are cut to allow the T/RH sensor body to pass through them. As shown in Figure 6, feed the T/RH sensor from inside the enclosure, through the stuffing tube, then feed the sensor through the stuffing tube compression nut. The stuffing tube washers and grommet can be fitted around the cable once the sensor cable has been routed.
8. Remove the yellow protective cover from the T/RH sensor. Feed the pull-cable through the fold-down arm and attach the sensor to the pull-cable cylinder using electrical tape. Gently feed/pull the sensor/cable through the arm. Always use the pull-cable to install the T/RH sensor to avoid kinking the sensor cable as it is fed through the fold-down arm.
9. Once the T/RH sensor has been routed through the arm, continue to feed enough cable through the arm to create a drip-loop in the sensor cable (see Figure 7).
10. The PVC tube securing the sensor is held in place by a thumbscrew (see Figure 8). The PVC tube can be removed from the arm assembly by loosening the thumbscrew and pulling the PVC tube out the bottom. This feature allows the sensor to be installed or replaced without having to remove the radiation shield

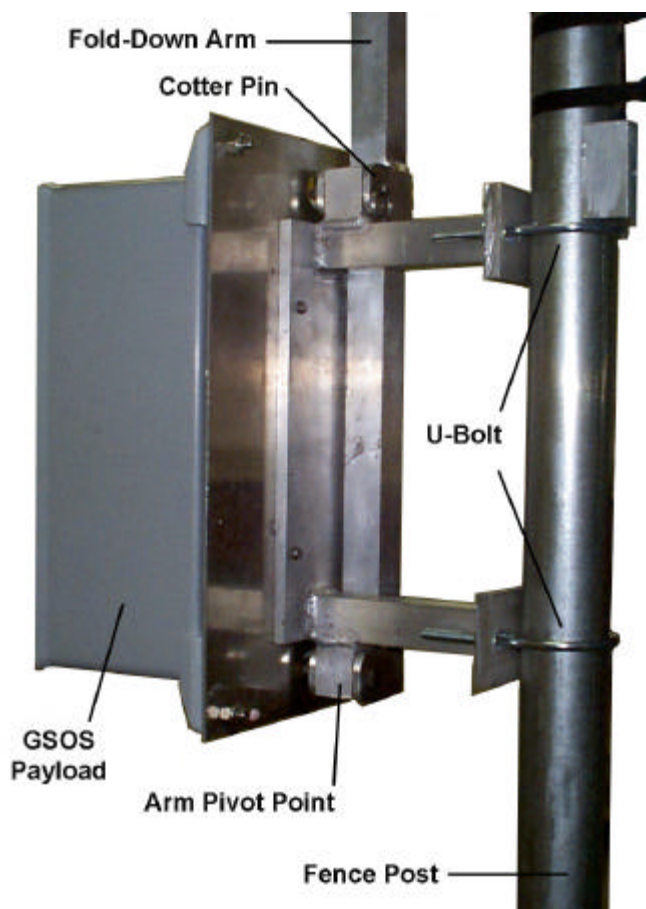


Figure 4 GSOS Mounting Assembly



Figure 5 T/RH Sensor Cable Routing/Installation

surrounding the sensor.

The sensor is held in place by a hex-head setscrew. The setscrew should align with a metallic hex nut located at the base of the sensor housing. A second hole is drilled in the PVC tube (opposite from the setscrew) to allow visual sighting and alignment of the sensor body during installation or replacement. Once the sensor body is properly aligned with the setscrew in the PVC tube, tighten the setscrew.

To secure the PVC tube in the arm assembly, insert the tube until the scribe line on the PVC tube aligns flush with the bottom of the aluminum cube. This will ensure the thumbscrew aligns with the indentation on the PVC tube. Tighten the thumbscrew.

11. Carefully coil the excess Temperature/RH sensor cable and place the spool in the bottom of the GSOS Payload. The sensor cable extending from the bottom of the GSOS Payload should be long enough to form a comfortable drip-loop and allow the arm to raise and lower without stressing the cable.
12. Install the two plastic washers and rubber grommet around the Temperature/RH sensor as shown in Figure 6, and tighten the compression nut on the stuffing tube.
13. Connect the pressure hose extending from the base of the fold-down arm to the Swagelock fitting on the bottom of the GSOS Payload. The Swagelock fitting uses a ferrule that crimps down on the pressure hose when the nut is tightened. As shown if Figure 9, remove the nut and ferrule from the fitting, and install the nut and ferrule on the pressure hose. Fully insert the hose into the bulkhead, and tighten the nut 1 and 1/4 turns past finger tight.

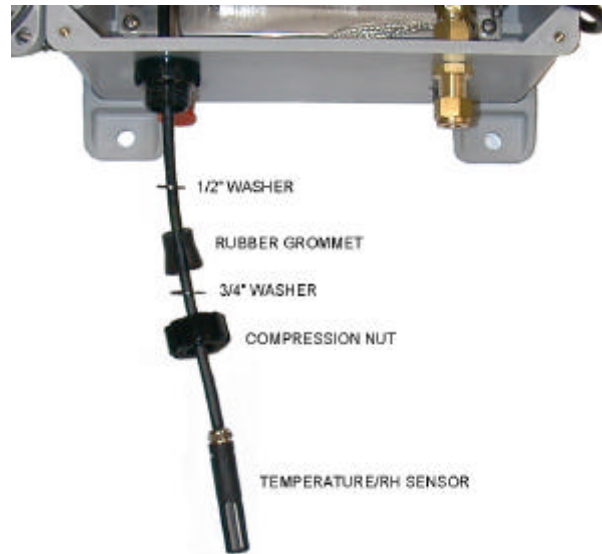


Figure 6 T/RH sensor cable stuffing tube assembly



Figure 7 T/RH Sensor installation

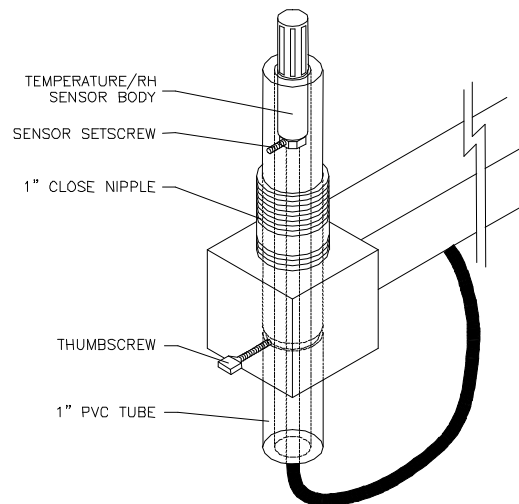


Figure 8 T/RH Sensor prior to radiation shield Installation

14. Remove the cotter pin that secures the arm in the vertical position and fold the arm down counter clockwise (see Figure 5).
15. Screw the barometric pressure port extension into the fold-down arm as shown in Figures 5 and 7.
16. Carefully screw the sensor radiation shield onto the fold-down arm as shown in Figure 5. Avoid over-tightening or cross-threading the radiation shield or it could be damaged.
17. Attach the interface cable's braided ground strap to the ground lug, attach the ground wire to the lug, and secure the nut on the ground lug (see Figure 10). *The ground wire must be connected to a good earth ground or ground rod.*
18. Connect the GSOS Power and Communications Interface Cable to the military style connector on the bottom of the GSOS Payload (see Figure 10).

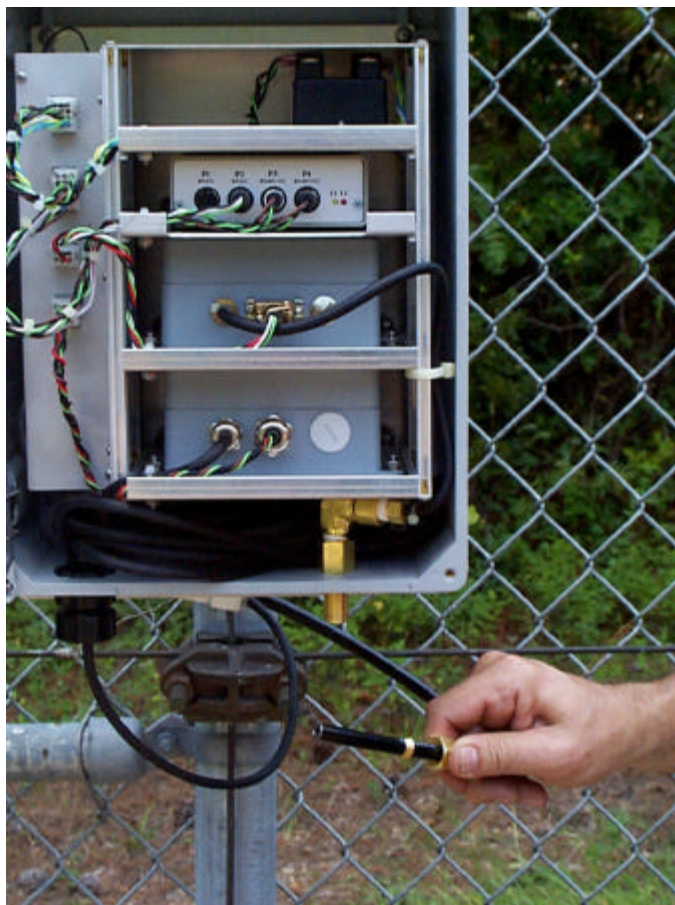


Figure 9 Connecting the Barometric Pressure Hose

GSOS POWER AND COMMUNICATIONS

1. Route the GSOS Power and Communications Interface cable into the location or building where the GSOS Power Supply and Communications Interface Assembly will be located.
2. Mount the GSOS Power Supply and Communications Interface Assembly (see Figure 11) in an equipment rack or rack frame. Clip-nuts and screws are provided for this purpose.

Figure 12 shows a typical installation of a GSOS Power Supply Assembly in an equipment cabinet. The assembly is bolted to the rack angle using two screws.

3. Ground the GSOS Power Supply and Communications Interface to the equipment cabinet by attaching the grounding cable supplied with the installation kit to the grounding lug on the Power Supply.

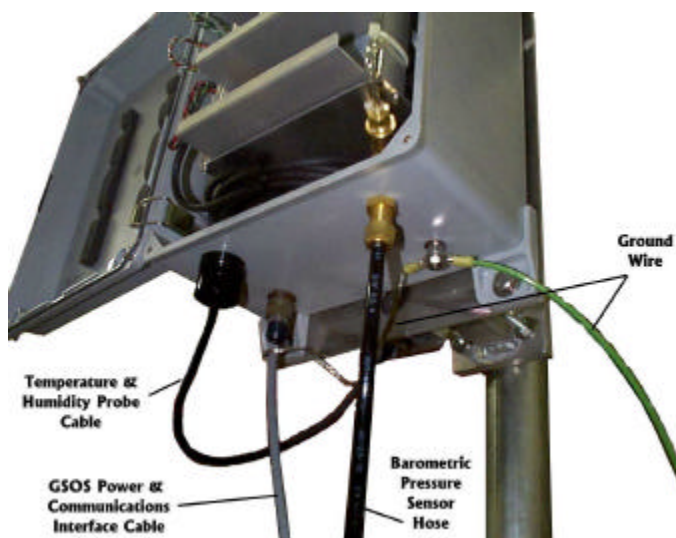


Figure 10 GSOS Payload Interconnections

4. Connect the GSOS Interface cable to the power supply quick-disconnect connector on the GSOS Power Supply Assembly.
5. Connect the RS-232 communications cable to the host computer system or communications device. Installations at NOAA Profiler sites involve connecting the other end of the 25-pin serial cable to a RS-422 to RS-232 converter on the GSOS Power Supply. Installations at DGPS sites involve connecting the 25-pin serial cable to a jumper box on the GSOS Power Supply.
6. The GSOS Power Supply requires 120 VAC. Connect the GSOS Power Supply AC power cord to an AC outlet.

Once power is applied to the GSOS, LEDs on the micro-controller on the payload will blink, alternating between red and yellow until the GSOS's internal clock reaches a 5-minute boundary. From that point on, the LEDs on the micro-controller will alternate between red and yellow once every 5 minutes, indicating the GSOS has entered its acquisition cycle and is collecting data.

FINAL INSTALLATION

1. Install a desiccant canister in the top shelf of the GSOS Payload.
2. Secure the access cover on the GSOS Payload.

*** WARNING ***

Do not over-tighten the four screws on the GSOS Payload access cover, or the corners of the access cover will crack.

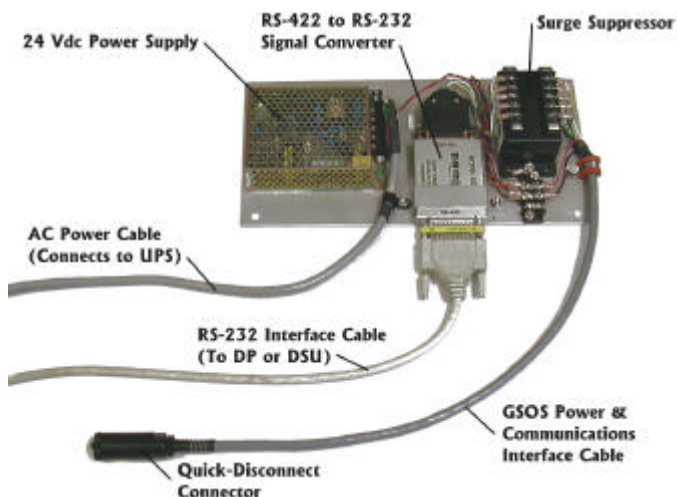


Figure 11 GSOS Power Supply and Communications Interface Assembly

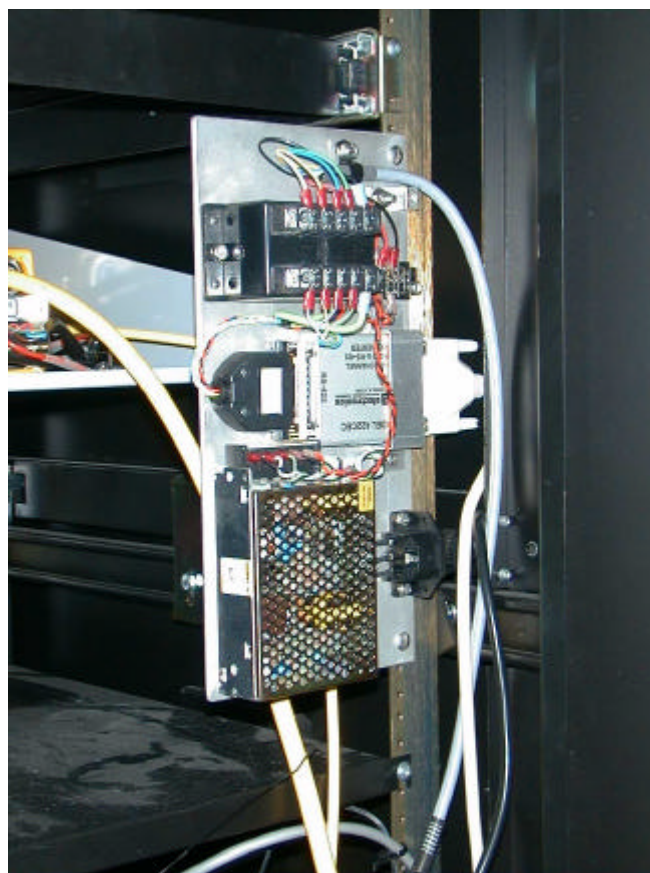


Figure 12 GSOS Power Supply and Communications Interface Installation